

Automation Bias with a Conversational Interface: User confirmation of misparsed information



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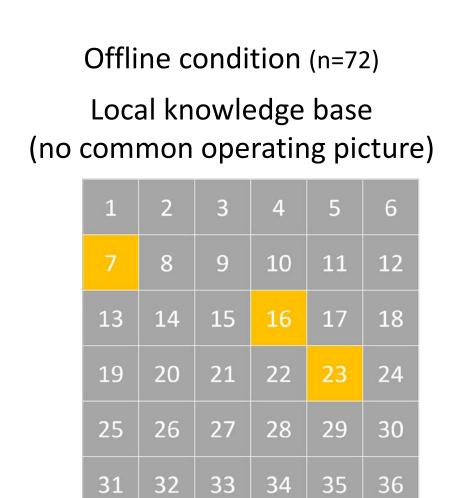
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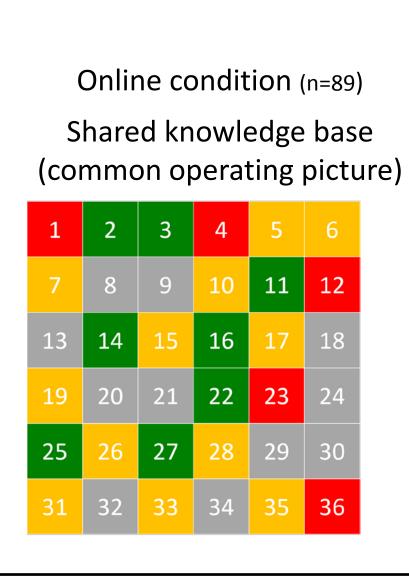
Abstract

- Users participated in a simulated intelligence, surveillance, and reconnaissance task using a conversational agent
- Automation bias and loss of SA? [1]-[2]
 Users accepted a surprising number of misparses of their inputs by the agent
- Highlights concerns for implementing a flexible conversational interface in safety critical environments (e.g., military, emergency operations)

Behavioral Experiment

- Used Simple Human Experiments
 Regarding Locally Observed Collective
 Knowledge (SHERLOCK) platform [3]-[5]
 Designed to support simple situation awareness tasks and the automated fusion of information from human tactical intelligent team members
 - 161 participants
 - 36 questions
 - Questions answered by visiting physical locations
 - Users report answers to conversational agent to populate knowledge base
 - Knowledge base reflected in dashboard





Misparses

- = parses containing a word/phrase that the computer agent was not preprogrammed with (computer agent was preprogrammed with every entity and relation needed to complete the task)
- Often misspelling, use of an entity or relation that was not preprogrammed

User: Zebra is in the **solver** room →

Agent: there is a room named 'solver' [should be "silver"]

User confirmation creates new entity in the knowledge base, allowing for further misparses

User: The apple is in the **solver** room > Agent: the fruit 'apple' is in the location '**solver**'

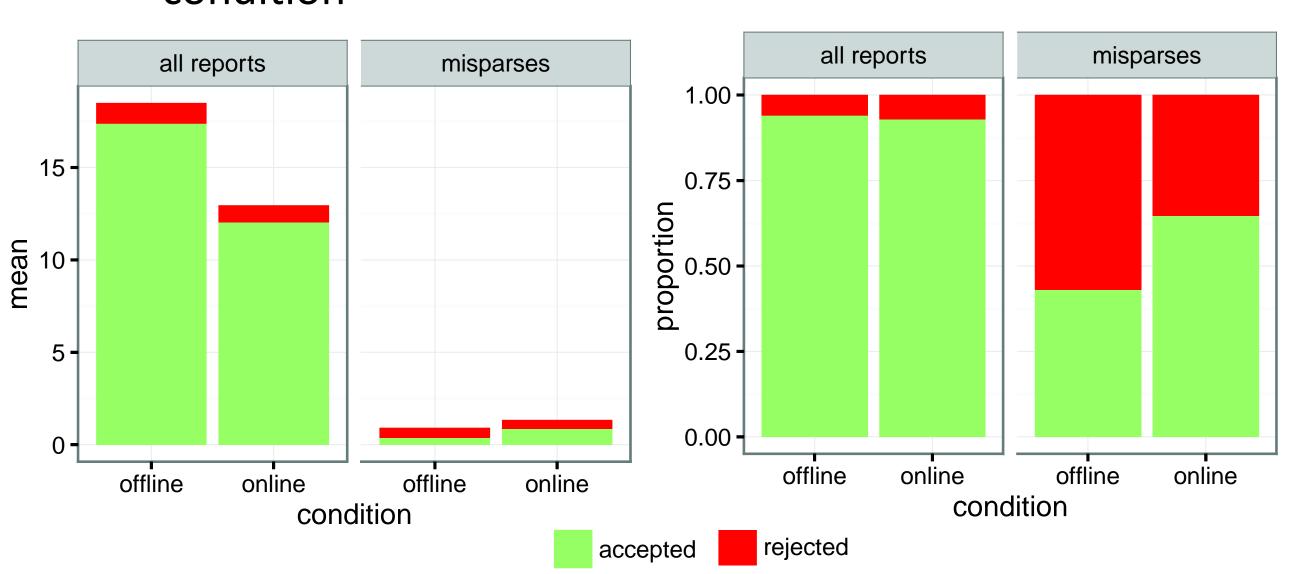
Conversational Interface 0 points the character 'Leopard' is ir ::: 0 points the location 'Ruby Room' the character 'Leopard' is in the character 'Leopard' is in the location 'Ruby Room' the location 'Ruby Room' the leopard plays tennis he leopard play User input OK. Is this what you meant OK. Is this what you meant? Agent parses input for user the character 'Leopard' play the character 'Leopard' plays to accept/reject the sport 'tennis' the sport 'tennis' the character 'Leopard' plays the sport 'tennis' Enter your message. Input suggestions Enter your message.

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Results

- All reports
 - Offline groups submitted more reports overall
 - Accept rate similar across conditions
 (p = 0.307, Odds Ratio (OR) = 0.835, OR 95% CI = 0.605 1.152)
- Misparses
 - Online participants had a higher accept rate (p = 0.005, Odds Ratio (OR) = 2.407, OR 95% CI = 1.299 4.514)
 - → The odds of a misparse being rejected in the offline condition are more than twice the odds in the online condition



Conclusions

Two potential complementary explanations for misparses:

- 1. Participants thought these parses were correct because of lack of familiarity with the conversational interface
 - Change the interface or training
 - Spell-check, Term merging, reserve words [6]
- 2. Automation bias and complacency: Users tended to accept the agent interpretation because it was generally correct (92%)
 - Hide common operating picture

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